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Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow

M.Tech

SEM: I - THEORY EXAMINATION (2021 - 2022)

Subject: Bioprocess Engineering & Technology

Time: 03:00 Hours Max. Marks: 70

General Instructions:

1. All questions are compulsory. It comprises of three Sections A, B and C.

- Section A - Question No- 1 is objective type question carrying 1 mark each & Question No- 2 is very short type questions carrying 2 marks each.
- Section B - Question No- 3 is Long answer type - I questions carrying 4 marks each.
- Section C - Question No- 4 to 8 are Long answer type - II questions carrying 7 marks each.
- No sheet should be left blank. Any written material after a Blank sheet will not be evaluated/checked.

SECTION A 15

1. Attempt all parts:-

1-a. What is the basic function of fermenter (CO1) 1

1. To recover the product
2. To provide optimum growth conditions to microbes
3. To purify the product
4. To sterlize the medium

1-b. The destruction of microorganisms by moist heat is described by (CO2) 1

1. Zero-order reaction
2. First-order reaction
3. Third-order reaction
4. Second-order reaction

1-c. The lowest yield of ATP is in (CO3) 1

1. Aerobic respiration
2. Aerobic fermentation
3. Anaerobic respiration
4. Fermentation

1-d. From which animals were insulin obtained in the early days? (CO4) 1

1. Insects
2. Lizard and snackes
3. Cats and dogs
4. Cattle and pigs

1-e. The process most often used in dairy industry is (CO5) 1

1. Sedimentation
2. Crystal growth
3. none of above
4. all of the above

2. Attempt all parts:-

2-a. What is the function of bioreactor in bioprocess engineering? (CO1) 2

2-b.	What is “Maximum possible yields”? (CO2)	2
2-c.	What is impeller flooding? (CO3)	2
2-d.	What are antibiotic? Give two examples? (CO4)	2
2-e.	What is scaling up in bioprocess engineering? (CO5)	2

SECTION B 20

3. Answer any five of the following:-

3-a.	Explain application of bioprocess engineering in daily life. (CO1)	4
3-b.	How feed back control work? (CO1)	4
3-c.	Explain thermodynamic behind microbial growth in batch reactor? (CO2)	4
3-d.	How RQ factor will be calculated of the bacterial growth, give example with proper equation? (CO2)	4
3-e.	Describe chemical method for KLa determination? (CO3)	4
3-f.	What is the difference between cumulative and co-operative control? (CO4)	4
3-g.	Explain working of HPLC? (CO5)	4

SECTION C 35

4. Answer any one of the following:-

4-a.	Draw the diagram of bioreactor with briefly explain each part of it. (CO1)	7
4-b.	How plant cell culturing is different from the animal cell culturing? (CO1)	7

5. Answer any one of the following:-

5-a.	Discuss about the oxygen consumption in aerobic batch culture. (CO2)	7
5-b.	What is available electron balance and yield in biochemical reaction? (CO2)	7

6. Answer any one of the following:-

6-a.	What are the factor that can effect the size of bubble? (CO3)	7
6-b.	Write the steps involve in transfer of oxygen from bubble to cell in bioreactor. (CO3)	7

7. Answer any one of the following:-

7-a.	Draw flow sheet for RSM. (CO4)	7
7-b.	Explain simplex method for media optimization? (CO4)	7

8. Answer any one of the following:-

8-a.	Describe the filtration process with filtration equipment? (CO5)	7
8-b.	Describe different type of centrifuge used in DSP? (CO5)	7